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CLAIMS

1. An optical module using optical waveguides, comprising at least:

an optical waveguide having a first core and an optical waveguide having a second core, an axial extension of said first core and that of said second core intersecting each other;

wherein:

a gap is formed between said first and second cores in adjacency to the intersecting region between the axial extensions of said first and second cores;

said gap being formed between a side face of said optical waveguide having the first core which side face runs along the axial direction of the first core and a light output face of said optical waveguide having the second core;

a width of said first core and that of said second core are narrower in the vicinity of the intersecting region between the axial extensions of said first and second cores than the respective other core portions; and

a groove which constitutes one end portion of said first core and a member having at least one of light transmitting, reflecting and absorbing characteristics and inserted into said groove are provided adjacent to the

intersecting region between the axial extensions of said first and second cores.

2. An optical module having optical waveguides according claim 1, further comprising a third core on a side opposite to said first core with respect to said member having at least one of light transmitting, reflecting and absorbing characteristics, a width of said third core being narrower in the vicinity of the groove than the other core portion.

3. An optical module using optical waveguides according to claim 2, wherein said first and third cores are separated from each other by the groove after formed integrally.

4. An optical module using optical waveguides according to claim 1, wherein said member having at least one of light transmitting, reflecting and absorbing characteristics is a member selected from the group consisting of a wavelength selection filter, a reflecting mirror, a half mirror, and a light absorbing plate.

5. An optical module using optical waveguides according to claim 2, wherein said member having at least one of light transmitting, reflecting and absorbing characteristics is a member selected from the group consisting of a wavelength selection filter, a reflecting mirror, a half mirror, and a light absorbing plate.

6. An optical module using optical waveguides according to claim 1, wherein the width in a direction orthogonal to the axial direction of said first core and the width in a direction orthogonal to the axial direction of said second core are narrower in tapered form in the vicinity of and toward said groove.

7. An optical module using optical waveguides according to claim 2, wherein the width in a direction orthogonal to the axial direction of said first core and the width in a direction orthogonal to the axial direction of said second core are narrower in tapered form toward said groove in the vicinity of and toward said groove.

8. An optical module using optical waveguides according to claim 1, wherein the tapered shape of the width in the direction orthogonal to the axial direction of said first core and that of the width in the direction orthogonal to the axial direction of said second core are each a shape such that an intensity distribution of light guided through the tapered region undergoes a quasi-static change in the axial direction.

9. An optical module using optical waveguides according to claim 2, wherein the tapered shape of the width in the direction orthogonal to the axial direction of said first core and that of the width in the direction orthogonal to the axial direction of said second core are

each a shape such that an intensity distribution of light guided through the tapered region undergoes a quasi-static change in the axial direction.

10. An optical module using optical waveguides, comprising:

a substrate;

a first clad layer formed over said substrate;

at least first and second cores formed over said first clad layer; and

a second clad layer covering at least said first and second cores;

wherein:

said second core has a certain angle relative to said first core and is optically coupled to said first core through a gap;

said gap being formed between a side face of said optical waveguide having the first core which side face runs along the axial direction of the first core and a light output face of said optical waveguide having the second core;

a width of said first core and that of said second core are narrower in the vicinity of the optically coupled region than the respective other core portions; and

a groove is formed so as to intersect said first core in the portion where the width of the first core is

narrower than the respective other portions of said first and second cores and in adjacency to the region where said second core is optically coupled to said first core.

11. An optical module using optical waveguides according to claim 10, wherein a member having at least one of light transmitting, reflecting and absorbing characteristics is inserted into said groove.

12. An optical module using optical waveguides according to claim 11, wherein said member having at least one of light transmitting, reflecting and absorbing characteristics is a member selected from the group consisting of a wavelength selection filter, a reflecting mirror, a half mirror, and a light absorbing plate.

13. An optical module using optical waveguides according to claim 10, wherein the width in a direction orthogonal to the axial direction of said first core and the width in a direction orthogonal to the axial direction of said second core are narrower in tapered form in the vicinity of and toward said groove.

14. An optical module using optical waveguides according to claim 10, wherein the tapered shape of the width in a direction orthogonal to the axial direction of said first core and that of the width in a direction orthogonal to the axial direction of said second core are each a shape such that an intensity distribution of light

guided through the tapered region undergoes a quasi-static change in the axial direction.

15. An optical module using optical waveguides according to claim 10, wherein between said groove and a terminal point of termination of changes in the width in a direction orthogonal to the axial direction of said first core and in the width in a direction orthogonal to the axial direction of said second core, the width in a direction orthogonal to the axial direction of said first core and the width in a direction orthogonal to the axial direction of said second core correspond each to the width at said terminal point of termination of a change in width of each of the cores.

16. An optical module using optical waveguides, comprising at least:

an optical waveguide having a first core and an optical waveguide having a second core, an axial extension of said first core and that of said second core intersecting each other;

wherein:

a gap is formed between said first and second cores in adjacency to the intersecting region between the axial extensions of the first and second cores;

said gap being formed between a side face of said optical waveguide having the first core which side face

runs along the axial direction of the first core and a light output face of said optical waveguide having the second core;

the width of said first core and that of said second core are narrower in the vicinity of the intersecting region between the axial extensions of said first and second cores than the respective other core portions; and

a plurality of optical waveguide constructions are provided in adjacency to the intersection region between the axial extensions of said first and second cores, each of said optical waveguide constructions comprising a groove which constitutes one end portion of said first core and a member having at least one of light transmitting, reflecting and absorbing characteristics and inserted into said groove.

17. An optical module using optical waveguides according to claim 16, wherein said member having at least one of light transmitting, reflecting and absorbing functions is provided on a light output face of said optical waveguide having the first core.